



Consommation
et Corporations Canada

Consumer and
Corporate Affairs Canada

Bureau des brevets

Patent Office

Ottawa, Canada
K1A 0C9

(11) (C) **1,285,583**

(21) 543,483

(22) 1987/07/30

(45) 1991/07/02

(52) 272-46

⁵
(51) INTL.CL. A63F-3/00

(19) (CA) **CANADIAN PATENT** (12)

(54) Board Game and Components Therefor

(72) Ingles, Andrew W. , Australia
Freestone, Melvin B. , Australia

(73) Forestry Commission of Tasmania , Australia
State Fire Commission , Australia

(57) 19 Claims

Canada

543483

ABSTRACT

A board game including a board having a playing surface marked to represent a land mass region on which can be plotted a burn area of a wild fire during a game play. Means are provided for randomly determining at least some characteristics of the wild fire and the land mass region environment to enable plotting of the burn area on the land mass region. Means are provided for fighting the fire having regard to the provided characteristics of the fire and land mass region environment in a manner aimed at bringing the fire to a controlled condition.

This invention relates generally to a board game and in particular to a game that simulates fighting a wild fire. The game is applicable to persons fighting wild bush fires, including the training and practice of those persons for fighting such fires, and it will be convenient to hereinafter describe the invention in relation to that exemplary application. It is to be appreciated, however, that the invention is not limited to that application and may be particularly played solely for player enjoyment.

10 In fighting wild fires, one important aim is to control the fire as quickly as possible whilst minimizing both final fire costs, and loss and damage to property and persons associated with that fire. Unfortunately, the opportunity for instruction of fire fighting personnel in procedures necessary to achieve that aim, together with practice of those procedures, often only comes from "on the job" work experience during fire fighting. However, that opportunity is usually only available to personnel during emergency or crisis situations when time and facilities may well not be available to properly and carefully explain those procedures. That in turn may lead to less than efficient instruction and practice and/or less than effective or efficient control of the fire.

20 It is an object of the present invention to alleviate this problem through the provision of a relatively simple board game which simulates the fighting of a wild fire, and which is particularly applicable in the training and practice of fire fighting personnel acting as game players.

With that in mind, the present invention provides a board game including: a board defining a playing surface marked to represent a land mass region on which can be plotted a burn area of a wild fire during a game play; means for randomly providing at least some characteristics of the wild fire and the land mass region environment; means for determining the fire burn area according to the provided characteristics of the fire and land mass region environment to enable plotting of the burn area on the land mass region; and, means for fighting the fire having regard to the provided characteristics of the fire and land mass region environment in a manner aimed at bringing the fire to a controlled

condition.

10 Preferably, the land mass region incorporates a variety of features marked on the playing surface. These features preferably affect at least some of the characteristics of the fire and its burn area. Those features preferably also affect access of the means for fighting the fire to the fire burn area. Preferably, some of those features are natural whilst others are man-made. In one preferred embodiment, the land mass region incorporates features which include one or more of the following: water courses and water holdings such as rivers, swamps and dams; varying land terrain such as hills, valleys, rock scree, and cliffs; buildings; roads and other vehicle and personnel access tracks; and previously constructed fire breaks.

20 Preferably, the land mass region is scaled so as to provide an indication to game players of the location and size of any fire burn area relative to the incorporated features. In one preferred embodiment, the land mass region is presented as a survey map having a grid reference system. That map may be an actual land survey map, such as of the region in which the game players are located, to provide added authenticity to the game.

Preferably, the board is composed of material that allows the playing surface to be directly or indirectly drawn on. In this manner, the fire burn area can be plotted during the game play. Preferably, the plotted burn areas can be readily removed therefrom so that the board is reusable.

30 In one preferred embodiment, the board includes a base sheet defining the playing surface marked with the land mass area, and a transparent overlay sheet that can be placed over the playing surface for plotting the fire burn area during game play.

39 Preferably, the means for fighting the fire provides the game players with imaginary fire fighting equipment by way of fire fighting personnel and/or fire fighting gear for those personnel which can be utilized to fight fire. That means preferably includes one or more fire fighting stations(s) which may be included in "built-up" sections marked on the land mass region at which the equipment is available.

KW



In one preferred embodiment, some of the fire fighting personnel are grouped into hand-crews whilst other personnel are associated with the fire fighting gear. That gear, in one embodiment, includes personnel transportation vehicles such as four wheel drive trucks, and fire fighting vehicles such as bulldozers, and tankers.

10 The means representing the fire fighting equipment may include a plurality of game counters arranged for basing at the fire station(s) and for movement to and from the fire burn area plotted on the playing surface. Those counters may be formed so as to be distinguishable from one another according to the fire fighting equipment they are intended to represent. In that regard, the counters may be shaped so as to give the appearance of fire fighting personnel or fire fighting gear, and may be of different colours according to the fire station(s) at which they are based during game play.

20 Preferably, the means providing characteristics of the fire and region environment provides fire commencement data to the game players at the start of game play. Preferably, that data includes a point location of fire commencement on the land mass region so that the fire location can be plotted on the region. Preferably, that data also includes the time of day of fire commencement.

In one preferred embodiment, the fire point location data is provided as point coordinates of the grid reference system of the region survey map. In addition, in this embodiment, the time of day data is provided as day times such as, for example, 6.00 a.m., 10.00 a.m., 2.00 p.m. and 6.00 p.m.

30 Preferably, the means providing characteristics of the fire and region environment also provide data on the land region environment in which the fire is burning. That data, preferably, includes information on certain physical conditions of the land mass area. That data, preferably, also includes information on the weather conditions in which the fire is burning. That data is preferably effective during game play for only a preselected fire burning period. Thus, if the game play continues beyond any one such fire burning period then the data for that period is no longer relevant and must be re-provided.

39



In one preferred embodiment, the data on the physical conditions of the land mass area includes information on one or more of the following: amount of land mass fuel available for burning by the fire within the burn area, which may be expressed in weight per area; the period since rain last fell on the burn area; the quantity of rain during that last fall; and the soil dryness in the burn area. In this embodiment, the weather conditions data includes information on one or more of the following: temperature, relative humidity, wind speed, and wind direction in the fire burn area.

Preferably, the means providing characteristics of the fire and region environment also provides contingency occurrence data during fire burning. That data is preferably effective during game play for various preselected fire burning periods, so that it may be available only for preselected fire burning periods as is the fire commencement data and region environment data. Preferably, the contingency occurrence data include the provision of information on the availability of fire fighting equipment and any changes in that availability. That data preferably may also include information on sudden or unexpected changes in the region environment data.

In one preferred embodiment, the data on the availability of the fire fighting equipment may include information on one or more of the following: an additional piece of fire fighting gear, such as a bulldozer or tanker, is available in a certain time period, or for a certain time period; a piece of fire fighting gear has broken down or has been damaged and is unavailable for a certain game period; and, fire fighting personnel perhaps operating a piece of gear has been injured or become ill or is otherwise unavailable for a certain game period. Sudden changes in the region environment data may include information on one or more of the following: a wind direction change; a wind speed change; and an increase or decrease in the amount of available fuel for burning by the fire in the burn area.

Preferably, the means providing characteristics of the fire and region environment includes one or more selectors providing the game data. Preferably, at least certain of the



data on fire commencement, region environment, and contingency occurrences, are each provided on one or more separate selectors.

10 In one preferred embodiment, each of the fire commencement data, region environment data and contingency occurrence data is provided on at least one set of selectors, one selector being randomly selectable from each set to provide respective data information. Each selector set may be a set of game cards, in this form, with each card having data information printed thereon which is hidden from view when selected by a game player. There may be, for example, separate sets of game cards with respective sets having the following data information thereon:-

CARD SET A (START CARDS)

fire commencement point coordinates; wind direction; amount of forest fuel; and cause of fire.

CARD SET B (WEATHER CARDS)

weather conditions listing temperature, relative humidity, and wind speed for a particular fire start time.

20 CARD SET C (DROUGHT CARDS)

period since rain; how much rain; soil dryness index; and condition of any grass

CARD SET D (EVENT CARDS)

contingency occurrences.

30 Preferably, the means determining fire burn area provides data which enables a plot of an anticipated future outline of the fire to be placed on the land mass region. Preferably, that outline data is only effective during game play for a preselected future fire burning period so that the outline plotted is of the anticipated burn area at the end of that fire burning period. Thus, like the data provided on the fire and region environment characteristics, that burn area outline may well require replotting if the game play continues beyond any one fire burning period for which the outline has been plotted. That fire burning period preferably corresponds to the period in which the fire and environment characteristic data is effective.

39 In one preferred embodiment, that data for plotting the burn area outline is provided as distances over which that



fire is anticipated to burn in different directions during the succeeding fire burning period. In this embodiment, those distances can then be plotted on the land mass region and the terminal point coordinates interconnected to provide a diamond shaped fire threatened area outline. As will be explained more fully hereinafter, this fire threatened area outline may coincide with the burn area outline, or the burn area outline may be plotted therefrom.

10 In this preferred embodiment, the directions of those distances of fire burn may be four, and they may be selected as being with the wind, against the wind, and oppositely across the wind from the fire commencement location point.

In this preferred embodiment, the fire burning distances are calculated. In that regard, initially a fire danger rating is calculated from the provided (known) characteristics of: the quantity of rain which fell during last fall; the period since that rainfall; the soil dryness; and, the environment temperature, relative humidity and wind speed. That rating, is a numerical value and the higher that value
20 then the greater the anticipated fire burning distances during a succeeding fire burning period. This fire danger rating may be determined and calculated by any suitable method although for authenticity in the game that rating is to standard fire danger ratings determined in actual practice. In one embodiment, those ratings may be calculated using any suitable reckoning instrument such as, for example, a McArthur's wheel or modified version thereof.

In this preferred embodiment, with the fire danger rating and the amount of fuel data information, the fire
30 burning distances in each direction are then calculated. Those distances may also be calculated by any suitable method which, for authenticity, may be as those distances are calculated in actual practice. In one example, those distances may be ascertained from reference to tables such as TABLE 1 followed by TABLE 2 attached hereto.

1285583

TABLE 1

F. D. Amount of Fuel	LOW	MOD	HIGH	VERY HIGH		EXTREME		
	3-8	9-13	14-20	21-30	31-45	46-55	56-70	71-85
Tonnes each hectare	M E T E R S E A C H H O U R							
5	30	60	90	140	230	280	340	450
10	60	120	180	240	450	560	670	890
15	90	180	260	430	680	850	1020	1350
20	120	240	360	600	960	1200	1440	1820
25	140	300	400	750	1200	1500	1800	2400

TABLE 2

BASIC RATE (Meters in an Hour)

	90	120	180	240	300	360	430	560	600	670	850	1020	1200
	O V E R A F O U R H O U R P E R I O D (M e t e r s)												
ALONG FRONT	360	480	720	960	1200	1440	1720	2240	2400	2680	3400	4080	4800
ALONG BACK	70	100	140	190	240	290	340	460	480	560	680	830	890
ALONG SIDES	120	170	240	310	390	480	570	720	800	920	1110	1360	1470



In our alternative simplified preferred embodiment, the means for determining the fire burn area may include at least one device by which the fire burn area is plotted and which avoids or minimises the need for fire burning distance data. The or each device in this embodiment includes a diamond shaped area template which, when a trace line is made about its perimeter onto the land mass region, provides a diamond shaped threatened area outline for the or a respective fire burning period. For successive fire burning periods a plurality of templates will be provided each successive template being larger than the preceding template.

To determine the correct orientation for the area template the wind direction is used and the template laid on the land mass region so that a major diagonal axis coincides with that direction.

In this embodiment, the actual position of the area template on the land mass region may be determined by initially plotting the distances of fire burn just with and against the wind. Then, with the template correctly orientated respective apexes of the template are successively placed at those plots and, at each apex placement, space lines are made along the template sides adjacent that apex. Those trace lines are then interconnected to provide a diamond shaped fire threatened area outline as before.

In this embodiment, the actual position of the template may be alternatively determined by providing the template with a mark indicative of the fire commencement point, so the template is simply positioned by placing the mark coincident with the fire point previously marked on the land mass region.

Preferably, the manner in which the fire fighting means is utilised to control the fire is governed by a set of rules under which the game is played. Those rules preferably include some basic rules and practices of fire fighting to provide the game with an element of authenticity. To that end, preferably, the rules broadly provide that the control condition of the fire, and thus game end, is when the burn area outline has a personnel patrolled fire break extending entirely therealong. In addition, preferably, the rules provide that the game is played by one or more persons acting



as a team striving to achieve the control condition in as short an imaginary game time as possible and/or for as little financial cost as possible, that cost being determined after the game by evaluation of losses and damage caused by the fire and the fire fighting operating costs. Accordingly, preferably under those rules a team wins a game if the control condition is achieved within the imaginary game time when playing alone, or with the lowest financial cost when playing against another time in a separate game.

10 In one preferred embodiment, a team of players consists usually of four persons but may be up to eight persons. Each of those persons is allocated a specific job during the game and those jobs may be, for example:-

1. Team leader who makes sure the game is played within the rules and any time limits, helps the team to work together, and calculates final cost of the fire and is responsible for decision making concerning the saving of lives and property.
2. Organiser who arranges for equipment location at the burn area and keeps a record of equipment movement, decides
20 where the fire breaks can be constructed with the equipment available, and calculates how long it takes the equipment to reach the burn area and the length of fire break that can be constructed.
3. Expert who determines fire and land mass region characteristics, assesses weather conditions, and decides how the fire will behave during the fire burning period.
4. Mapper who identifies particular features on land mass region, and plots fire burn area together with the marking of the fire breaks as constructed.

30 In one preferred embodiment, the set of rules provides an imaginary game time which represents a realistic period of fire fighting and all data provided is based on that period. It is to be appreciated, however, that the actual game playing time is much less than the imaginary game time. That game time may be, for example, 20 hours with actual game playing time being about 40 minutes. In this embodiment, that game time is divided into fire burning periods during which the various data is effective as explained above. Each fire
39 burning period may be, for example, four hours.



In one preferred embodiment the set of rules operate to control the quantity of fire fighting equipment available at the or each fire fighting station. In this embodiment, that equipment may vary so that at the or each station some equipment may be immediately available at the commencement of a fire whilst other equipment will be available at some time thereafter or for only certain fire burning periods.

10 In one preferred embodiment, the set of rules operate to control the speed of travel of the fire fighting equipment over the land mass region during fire fighting. That speed may be dependent on factors including one or more of the following: the nature of the equipment; and, the land terrain over which the equipment is to be moved. Thus, the speed of travel of fire fighting personnel on foot will be different to that of gear such as bulldozers or tankers, as will the speed of travel over sealed roads or newly constructed fire break. In this preferred embodiment, the rules provide for determining the speed of travel in any suitable manner, and in one example, the speed of travel may be determined as set out
20 in TABLE 3.



TABLE 3

SPEED OF TRAVEL

CIRCUMSTANCES →	WHEN MAKING A FIRE-BREAK	WHEN MOVING FROM ONE PLACE TO ANOTHER	WHEN MOVING FROM ONE PLACE TO ANOTHER	WHEN TRAVELLING ALONG WELL MADE ROADS	WHEN PATROLLING A FIRE-BREAK EXISTING OR FRESHLY MADE
(The speed, changes, depending on the SLOPE of land and amount of fuel in forest, i.e. how thick the scrub is).		1. Along a FIRE-BREAK made by a bulldozer or 2. Along CLEARED land or 3. Along a ROUGH VEHICULAR TRACK	1. Along a FIRE-BREAK made by a hand crew or 2. Through the bush		
WHO ↓					
on float					
BULLDOZER on its tracks	Consult your notes	5 km an hour (100m/min)	Consult your notes (Same speed as making	40 km an hour 12 km an hour (200m/min) fire-breaks)	
walking	Consult your notes	3 km an hour (50m/min) 12 km an hour (200m/min)	1.5 km an hour (25m/min)	6 km an hour (100m/min) 60 km an hour (1000m/min)	Consult your notes Along bulldozed fire-breaks only. Consult your notes
HANDCREW in 4 wheel-drive					
TANKER		12 km an hour (200m/min)		60 km an hour (1000m/min)	Along bulldozed fire-breaks only. Consult your notes.

1285583

10 In one preferred embodiment, the set of rules may operate to control the speed with which a fire break may be constructed along the outline of the fire burn area. That construction speed may be dependent on factors including one or more of the following: the nature of fire fighting equipment preparing that fire break; and, the land terrain in which that fire break is being constructed. Thus, the speed of construction may vary between fire fighting personnel on foot using hand tools, and those using gear such as bulldozers, whilst steep or heavily fueled land will vary from flat or lightly fueled land. In this preferred embodiment, the rules provide for determining the construction speed in any suitable manner, and in one example, the speed of construction may be determined as set out in TABLE 4.

KW



TABLE 4

A. ON FLAT AREAS

Amount of Fuel	USING BULLDOZERS			USING PEOPLE
	D8 Size (Big)	D7 Size (Medium)	D6 Size (Small)	1 Crew of 5 People
In light bush 1 to 15 tonne/hectare	1000-/hr	900 m/hr	800 m/hr	100 m/hr
In dense bush 16 or more tonne/hectare	700 m/hr	550 m/hr	500 m/hr	60 m/hr

B. ON STEEP AREAS

Amount of Fuel	USING BULLDOZERS			USING PEOPLE
	D8 Size (Big)	D7 Size (Medium)	D6 Size (Small)	1 Crew of 5 People
In light bush 1 to 15 tonne/hectare	850 m/hr	750 m/hr	700 m/hr	30 m/hr
In dense bush 16 or more tonne/hectare	650 m/hr	550 m/hr	450 m/hr	

C. ON VERY STEEP AREAS

Amount of Fuel	USING BULLDOZERS			USING PEOPLE
	D8 Size (Big)	D7 Size (Medium)	D6 Size (Small)	1 Crew of 5 People
In light bush 1 to 15 tonne/hectare	TO STEEP TO OPERATE SAFELY			60 m/hr
In dense bush 16 or more tonne/hectare				40 m/hr

1285583

In one preferred embodiment, the set of rules may provide for the patrolling of a fire break once it has been constructed along the outline of the fire burn area. That patrol may be required to start work at the beginning of a fire burning period and continue to work until the end of that period which is beyond the one when the fire break construction was completed. During this patrol period the services of that equipment for other purposes is denied to the players.

- 10 In one preferred embodiment, the set of rules operate to control the length of fire break that may be patrolled by the fire fighting equipment. That distance, may depend on factors including the fire danger rating during the fire break patrol. In that regard, the greater the fire danger rating then the less length of fire break that may be patrolled in any fire burning period, in this form. In this preferred embodiment, the rules provide for determining the patrol length in any suitable manner, and in one example, that patrol length may be determined as set out in TABLE 5.



1285583

TABLE 5

Distance patrolled by a TANKER

F.D.R. Distance in an hour

1 to 11	5000 m
12 to 23	4000 m
24 to 49	2000 m
50 or more	1000 m

Distance patrolled by HAND CREW when walking or with vehicle

F.D.R. Distance in an hour

1 to 11	3000 m
12 to 23	2000 m
24 to 49	1500 m
50 or more	100 m *may be dangerous

KW

- 16 -



In one preferred embodiment, the set of rules provide for determining costing of the fire on the basis of one or more of the following factors: personnel killed or injured; buildings damaged; land mass area burnt; fire fighting gear lost or damaged; fire fighting personnel working costs and fire fighting gear operating costs. The costs, may be calculated according to predetermined values assigned to each item by the set of rules so that, in one example, the costs may be as follows:

- 10 Person killed - \$400,000,
- Person injured - \$100,000,
- Building damaged - \$ 0,000,
- Land mass burnt - \$18,000 per hectare,
- Gear lost - \$100,000,
- Gear damaged - \$30,000,
- Fire fighting personnel - \$70.00 per hour,
- Fire fighting gear operating cost - \$70.00 per hour.

The costs of the fire fighting personnel and gear may vary depending upon the time of day during which the fire is being fought.

20 It should be appreciated that the game of the present invention provides for the replacement of these and/or the addition of other fire fighting rules and practices upon agreement between the game players. The addition of such rules and practices may be dependent upon the familiarity of the players to both the game and the rules of fire fighting so that, for example, experienced fire fighting personnel may add numerous rules and practices to the conditions under which the game is played.

30 In one preferred embodiment, those additional rules and practices may include one or more of the foregoing:-

- 1. Fire breaks cannot be made inside the anticipated fire burn area.
- 2. On the land mass region the following can be used as an existing fire break when falling within the fire burn area - sealed, unsealed roads and vehicle tracks, rivers, and rock screes.
- 3. Fire fighting personnel and gear must always start a new fire break from an existing fire break.

39

4. Fire breaks may only be made between 6.00 a.m. and 10.00 p.m.
5. Fire fighting personnel patrols along fire breaks may be made after 10.00 p.m. but overtime costs are incurred.
6. When moving fire fighting gear from one part of the land mass region to another, only vehicle tracks and fire breaks made by fire fighting gear can be used, so that they cannot be moved along fire breaks which have been made by personnel.
- 10 7. There must be a predetermined rest period for personnel with an each fire burning period. Time of travel can count as rest period and where two personnel accompany each piece of gear then rest periods are not required.
8. Fire fighting gear must leave their work place at 9.00 a.m. to be driven to a safe place to be refueled.
9. Fire fighting personnel must not be used within a certain distance of an anticipated fire burn area outline to make a fire break in front of the fire during the last hour of any fire burning period if the fire danger rating is above a certain value.
- 20 10. An assumption may be made that the fire does not spread between 10.00 p.m. and 6.00 a.m.
11. Personnel can be ready for work at any road or track site at 6.00 a.m. on any following day of a fire.

In order to further understand the game of the present invention the playing of a preferred embodiment of the game will now be described. To facilitate that description reference will be made to the accompanying drawings where the game is illustrated as at various stages during game play. It is to be understood that the game is not limited to the preferred embodiment as described or illustrated.

Prior to commencement of the game the game players are organised into jobs of leader, organiser, expert and mapper with games of more than four players having these jobs shared and with less than four players having these jobs combined. Then, each of the data selector card sets A, B, C, and D (not illustrated) are shuffled and placed in individual stacks with their data information hidden from view.

39 To commence the game, individual cards are selected from



each of the sets A, B, and C by the Expert to provide the necessary data information (as previously detailed) for a first fire burning period of four hours. From the information on those cards, the Expert initially calculates the fire danger rating using reckoning instrument, illustrated in FIG.

1.

Instrument 1 comprises a series of superimposed plates 2, 3, 4, 5, 6, carrying ranges of data as illustrated related to characteristics of the land mass region environment. All the plates are connected together at axis 7 with plates 3 and 6, being relatively fixed whilst remaining plates 2, 4 and 5 are individually rotatable about axis 7. In calculating the fire danger rating with the known data information:

- (a) the known amount of rain shown on plate 2, is set opposite the known number of days since rain shown on plate 3;
- (b) the visible drought factor is obtained from that window on plate 2, adjacent the known soil dryness index;
- (c) the arrow on plate 4 is set opposite the obtained drought factor shown on plate 3;
- (d) plates 3 and 4 are held stationary and the known air temperature on plate 5 is set opposite the known relative humidity on plate 4; and
- (e) the fire danger rating is read from plate 6, opposite the known wind speed shown on plate 5.

With the fire danger rating calculated, the Expert can then determine the expected fire burning distances from Tables 1 and 2.

The Mapper then plots the fire threatened area outline and from that burn area outline on the game board 8, a section only of which is illustrated in detail in FIG. 2. Board 8, has scaled land mass region 9, mapped thereon which is overlaid with reference grid 10. Land mass region 9, includes stations 11, at which predetermined quantities of fire fighting personnel and/or gear are located, and land features such as roads 12, of various standards, water courses 13, and variable land terrain 14, as illustrated.

That plot can be made in the following sequence:-

1. Obtain the known grid reference coordinates for the fire

KW

commencement or START POINT from the EXPERT. Mark this on land mass region 9.





(Embodiment: 741 837
horizontal vertical)

2. From the EXPERT find the direction from which the wind is coming. Mark this as a long line through the START POINT. Put an arrow-head on the line in the wind's direction. Label this FRONT and the other end BACK.
(The embodiment shows a S.W. wind blowing).
- 10 3. Draw a long line at right angles to the wind direction and passing through the START POINT. Label each end SIDE.
4. From the EXPERT find out how far the fire will spread along the FRONT line during the fire burning period, using the set scale of the land mass region 9. Mark the distance with the distinct coordinate dot. Do the same for the distances along the BACK line and SIDE lines.
(In the embodiment: FRONT - 500m, BACK - 200m, SIDES - 300m).
- 20 Join these coordinate dots with a continuous line. The land mass region 9, as now marked is illustrated in FIG. 3 showing start point S, fire threatened area outline 15a, enclosing diamond shaped area 16a, which is the fire area that is threatened to be burnt out in the first fire burning period unless the fire is stopped by any existing fire break and a new fire break to be constructed.
It will be appreciated that threatened area outline 15a, may be more simply obtained using the template (not
- 30 illustrated) either with or without the front and back fire burning distances provided by the EXPERT.
5. On land mass region 9, now mark and existing fire breaks 17 in the fire threatened area 1ba. Track 12 and water course 13, act as fire breaks 17, in the embodiment.
6. Where an existing fire break 17, does not reach outline 15a, of fire threatened area 16a, its free end is joined to the nearest point on outline 15a, to join up existing fire breaks 17.
- 39 Shade the area enclosed by these existing fire breaks 17

KW



and threatened area outline 15a, along which fire breaks have to be constructed. The land mass region 9, now marked is illustrated in FIG. 4 showing shaded fire burn area 18a, which will be burnt during the first fire burning period. NO PERSONNEL OR GEAR CAN ENTER THIS AREA.

7. Now the team can decide how to fight the fire with predetermined equipment available from the ORGANISER. The Mapper records any fire breaks 19, constructed in the fire burning period and that may be achieved by marking them on land mass region 9. In this embodiment equipment was used to make a fire break 19 along the bottom front edge of the fire burn area 18a, but did not have time to completely protect the top front edge, or the back edges.
8. To help everyone understand who constructed fire breaks 19, indicia may be used, for example  for a bulldozer,  for two bulldozers working together and  for a land crew, and  for two land crews working together. The land mass region 9, marked after the first fire burning period is illustrated in FIG. 5, showing various fire breaks 19 constructed during that period.

Until the fire burn area 18a, is completely surrounded with fire breaks 17 and 19, the fire will continue to spread and, in particular, it will spread during the next succeeding fire burning period through the outline 15a, not having a fire break 17,19. Thus, at the end of the first fire burning period it is necessary for the Mapper to replot the fire burn area for the next period.

At the commencement of that next period the Expert initially selects individual cards from sets B and D, and calculates the new fire rating value and the burning distances, and the MAPPER again plots the fire burn area. In plotting that area it is necessary for the Mapper to take account of any wind direction change since the previous fire burning period as in the following sequence:-

9. Where the wind direction is the same then the distances that the fire will burn in the next burning period is

measured along the existing fire lines from the last coordinate points to provide new extended points which are joined together.

10. Follow instructions 5, 6 and 7 as before, remembering to include any new existing fire breaks 17, such as tracks 12. The land mass region 9, as now marked is illustrated in FIG. 6, showing new fire threatened area outline 15b, and shaded fire burn area 18b, all of which will be burnt in the next succeeding fire burning period.
- 10 11. Where there is a change in the wind direction, draw a line through the original START POINT showing the new wind direction, together with a line at right angles to it. Label the new line with FRONT, BACK and SIDES. In this embodiment, the wind has changed from S.W. to S.
12. Noticing that fire threatened area outline 15a, is diamond shaped, find on land mass region 9, and mark where outline 15a, cuts the new FRONT, BACK and SIDES and measure new fire burning distances obtained from the EXPERT from the marks just made.
- 20 13. Draw lines through these points parallel with the last outline 15a. Follow again above steps 5, 6 and 7. The land mass region 9, as now marked is illustrated in FIG. 7, showing new fire threatened area outline 15c, and shaded fire burn area 18c.
14. Fire burn areas 18b,c, again include any existing fire break 17. At any corner of previous outline 15a, from where the fire may spread extend the lines of that outline 15a, until they meet new outline 15b,c. Join these points of intersection to cut off the corner to show the fire burn area 18b,c.
- 30

With the new fire burn area 18b,c, the game players then decide how to provide fire breaks 19, along outline 15b,c, within the succeeding fire burning period. If fire breaks 17, 19, are not completed in that period then the previous steps 9 to 14 are again repeated.

- Once constructed and/or existing fire breaks 17, 19, completely surrounds fire burn area 18a,b,c, then it is necessary for the Organiser to arrange patrols along fire
- 39 breaks 17, 19, so as to ensure that the fire is contained



within the area. Those patrols start to work at the beginning of a fire burning period and continue to the end of that period which is beyond the one when fire breaks 17,19, completely enclosed the fire burning area 1a,b,c. The amount of fire break 17,19, that can be patrolled by fire fighting equipment depends on the fire danger rating as explained above.

10 Once the fire has been controlled with fire breaks 12, 14, which has been patrolled for the required fire burning period then the Team Leader calculates the cost of the fire to the team. In calculating that cost all travel and work time of the fire fighting equipment must be included, as must the cost of loss and damage to personnel and property involved or associated with the fire. Those costs may be calculated as set out above. Depending upon the speed with which the fire has been placed into the control condition and/or the cost of achieving that condition, the team wins or loses the game.

20 A board game according to the present invention may provide for authentic training and practice of fire fighting personnel in the procedures associated with fighting wild fires. That may be achieved without placing those personnel or outside property in an emergency situation.

30 In addition to being educational, the board game of the present invention may be entertaining for the game players. That is particularly so because the game is not dependent solely upon chance but relies heavily on the skill of the game players to assist in determining the ultimate game winners. That is facilitated by the game not being limited by rigid rules and having fixed markings upon the board. As such, player interest in the game is likely to be maintained despite regular playing.

It will be understood that various alterations, modifications and/or additions may be incorporated into the present invention without departing from the ambit of the invention as defined in the claims appended hereto.



Claims:

1. A board game including: a board defining a playing surface marked to represent a land mass region on which can be plotted a burn area of a wild fire during a game play; means for randomly providing at least some characteristics of the wild fire and the land mass region environment; means for determining the fire burn area according to the provided characteristics of the fire and land mass region environment to enable plotting of the burn area on the land mass region; and, means for fighting the fire having regard to the provided characteristics of the fire and land mass region environment in a manner aimed at bringing the fire to a controlled condition.
2. A board game as claimed in claim 1, wherein the land mass region includes one or more of the following features represented thereon; water courses and water holdings such as rivers, swamps, and dams; varying land terrain such as hills, valleys, rock screens, and cliffs; buildings; roads and other vehicle and personnel access tracks; and previously constructed fire breaks.
3. A board game as claimed in claim 1 or claim 2, wherein the land mass region is an actual or representation of a scaled land survey map having a grid reference system.
4. A board game as claimed in claim 1 or 2, wherein the board includes a base sheet defining the playing surface marked with the land mass region, and a transparent overlay sheet that can be placed over the playing surface and on which is plotted the fire burn area during game play.
5. A board game as claimed in claim 1, wherein the means providing characteristics of the fire and land mass region environment provides fire commencement data at the start of the game play.
6. A board game as claimed in claim 5, wherein the fire commencement data includes a point location of fire commencement on the land mass region so that the location can be marked on the land mass region and the burn area plotted therefrom.
7. A board game as claimed in claim 1, wherein the means providing characteristics of the fire and land mass region



environment includes data on the physical condition of the land mass area and the weather conditions in which the fire is burning.

8. A board game as claimed in claim 7, wherein the data on the physical conditions of the land mass area includes information on one or more of the following: amount of land mass fuel available for burning by the fire within the burn area, the period since rain last fell on the burn area, the quantity of rain during that last fall, and the soil dryness in the burn area; and the data on the weather conditions in which the fire is burning includes information on one or more of the following: temperature, relative humidity, wind speed, and wind direction in the fire burn area.
9. A board game as claimed in claim 1, wherein the means providing characteristics of the fire and land mass region environment includes data some of which is effective during game play for only a predetermined fire burning period.
10. A board game as claimed in claim 1, wherein the means providing the characteristics of the fire and land mass region environment includes contingency occurrence data during fire burning, that data being effective during game play for various preselected fire burning periods.
11. A board game as claimed in claim 10, wherein the contingency occurrence data includes provisions of information on the availability of means for fighting the fire and any changes in that availability, and/or information on sudden or unexpected changes in the region environment circumstances.
12. A board game as claimed in claim 1, wherein the means providing characteristics of the fire and land mass region environment includes at least one set of game cards containing data information.
13. A board game as claimed in claim 1, wherein the means for determining the fire burn area includes data enabling a plot of a threatened future outline of the fire for marking on the land mass region, the fire burn area being within the plotted threatened fire outline.
14. A board game as claimed in claim 1, wherein the means for determining the fire burn area includes a reckoning instrument operable to provide a fire danger rating value from



given characteristics of the fire and land mass region environment, the fire danger rating being used to provide the data for plotting the threatened fire outline.

15. A board game as claimed in claim 1, wherein the means for determining the fire burn area includes a device which is placed on the land mass region and plots a threatened future outline of the fire, the fire burn area being within the plotted threatened fire outline.

10 16. A board game as claimed in claim 15, wherein the device is a diamond shaped template positioned on the land mass region according to given characteristics of the fire and land mass region environment, a trace of the template forming the threatened fire outline.

17. a board game as claimed in claim 1, wherein the mean for fighting the fire provides game players with imaginary predetermined quantities of fire fighting personnel and/or fire fighting gear which can be utilised to fight the fire by forming continuous fire breaks about the fire burn area and thereby bring the fire to the controlled condition.

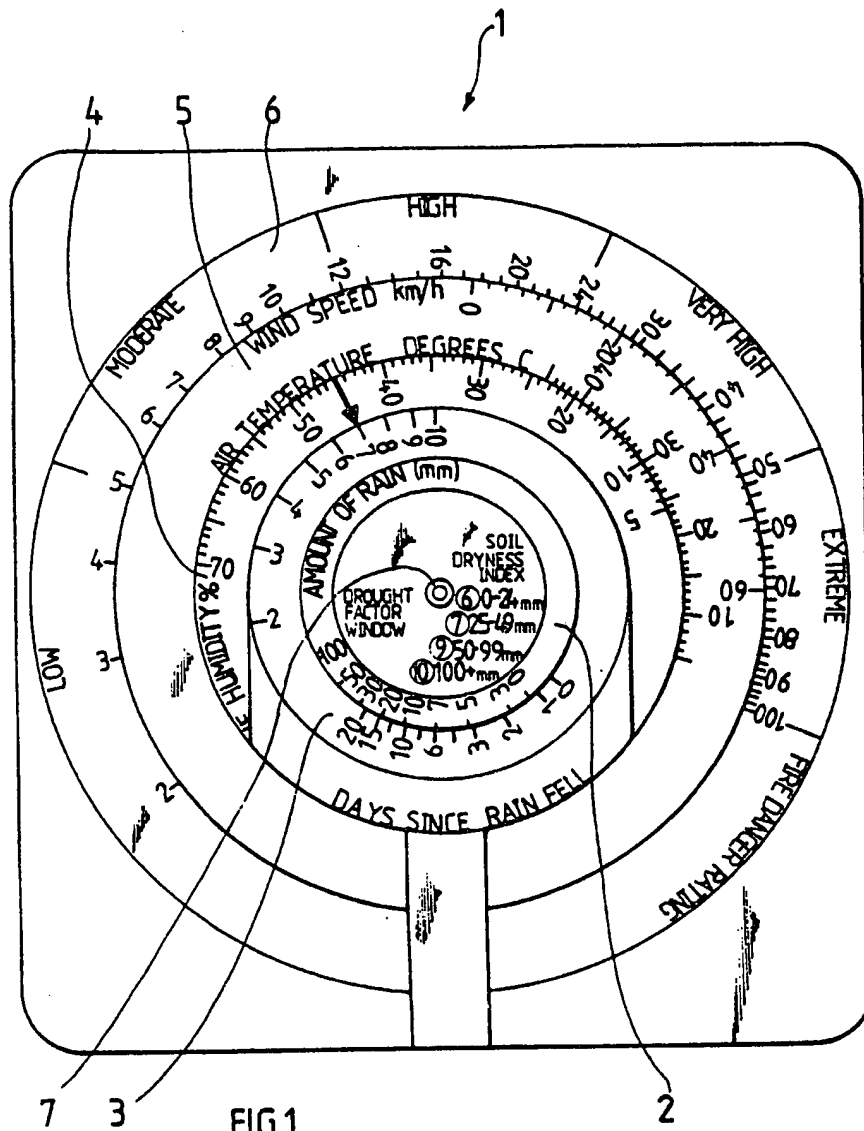
20 18. A board game as claimed in claim 17, wherein the means for fighting the fire includes one or more stations marked on the land mass region at which the imaginary fire fighting personnel and/or fire fighting gear is based.

19. A board game as claimed in claim 17 or claim 18, wherein the means for fighting the fire provides for the fire fighting personnel and/or fire fighting gear to be utilised to patrol the fire breaks when formed.

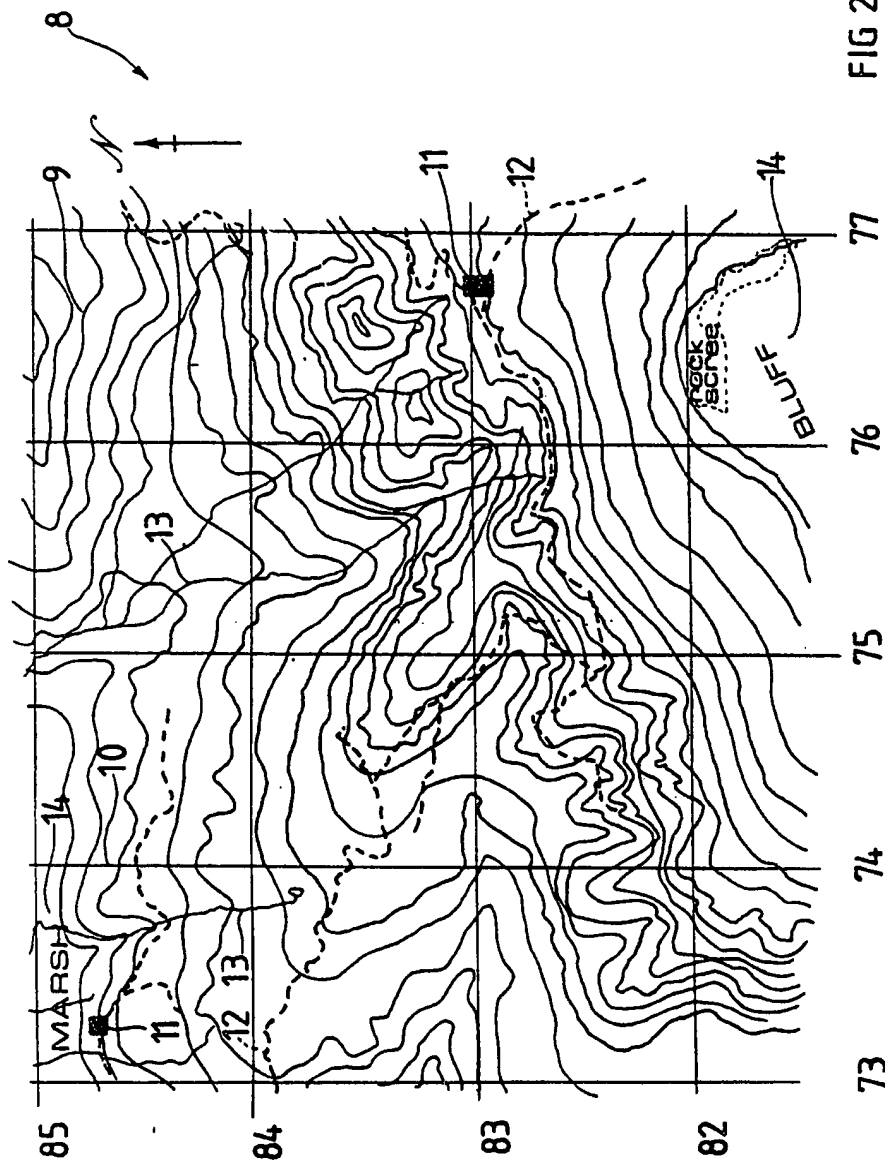
9544E

KW





Sim: M. Luning



Simon W. Lanning

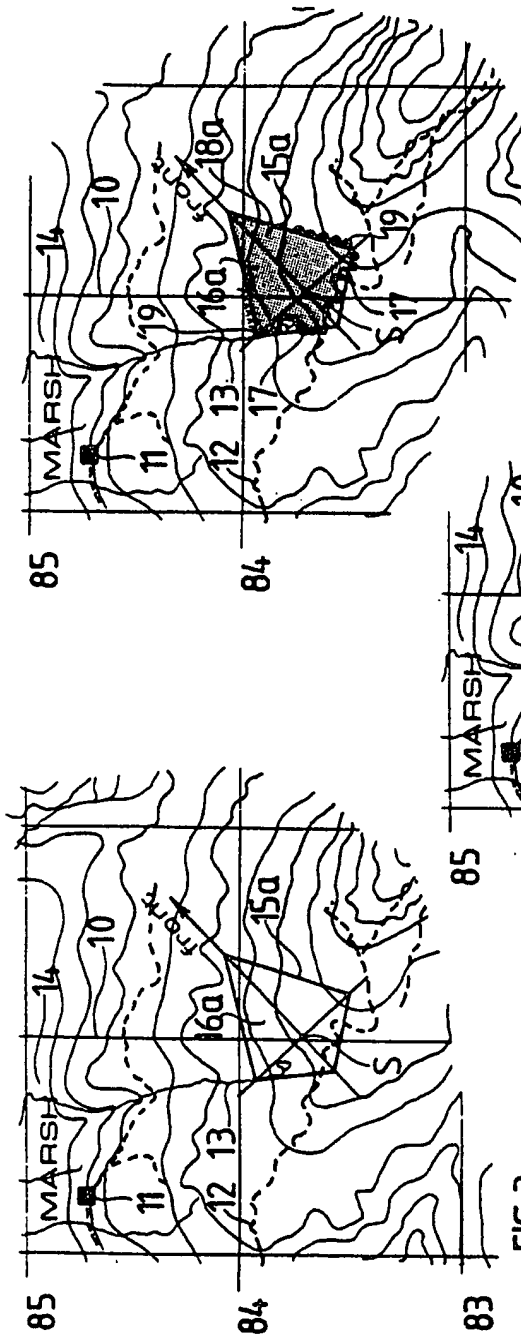


FIG 3

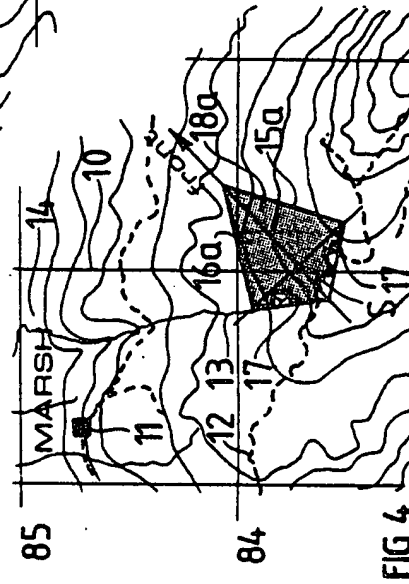


FIG 4

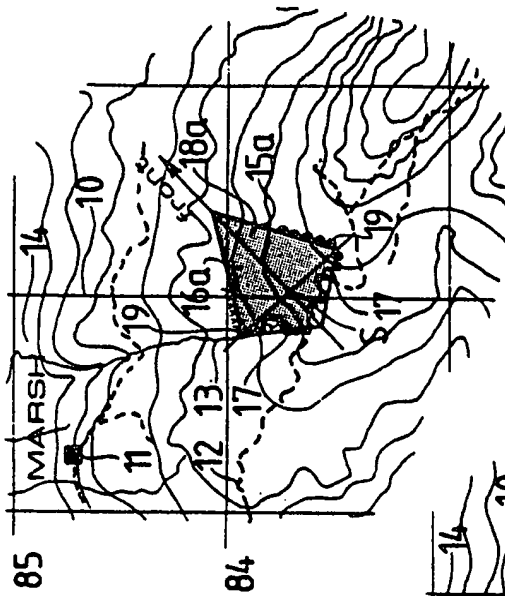
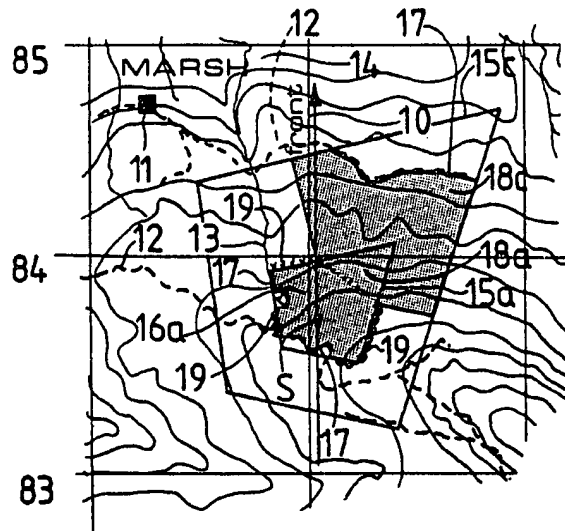
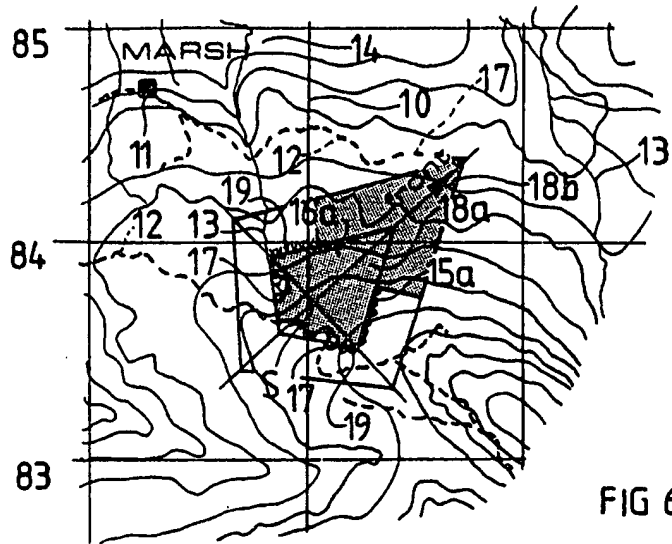


FIG 5

Drum: 1/2 Survey



Sim; M. Luning